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EXAMINER
BHARADWAJ, KALPANA

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/508,451	BREEUWER, MARCEL
	Examiner	Art Unit	
	KALPANA BHARADWAJ	2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>01 December 2008</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-20</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-20</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>08/07/2008</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

U.S. Patent and Trademark Office

PTOL-326 (Rev. 08-06)   **Office Action Summary**   Part of Paper No./Mail Date 20090302

DETAILED ACTION

1.   This Office Action is in response to an Appeal Brief entered 12/01/2008 for the

patent application 10/508,451 filed on 09/21/2004.

2.   All prior office actions are fully incorporated into this Office Action by reference.

Status of Claims

3.   Claims 1-20 are pending.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of
> matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the
> conditions and requirements of this title.

Claims 1-20 are rejected under 35 U.S.C. 101 for nonstatutory subject matter.

The computer system must set forth a practical application of § 101 judicial exception to

produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77. The

invention is ineligible because it has not been limited to a substantial practical

application. The "**method of analyzing a quantity having temporal and spatial**

variations" is not tied to a statutory class nor is a tangible result output.

In determining whether the claim is for a "practical application," the focus is not

on whether the steps taken to achieve a particular result are useful, tangible, and

concrete, but rather that the final result achieved by the claimed invention is useful,

tangible and concrete. If the claim is directed to a practical application of the § 101

judicial exceptions producing a result tied to the physical world that does not preempt

the judicial exception, then the claim meets the statutory requirement of 35 U. S. C. §

101.

The "**multidimensional output data array comprising array positions**

arranged along at least a first data-axis and a second data-axis does not produce a

practical application.

The invention must be for a practical application and either:

1) specify transforming (physical thing - article) or

2) have the Final Result (not the steps) achieve or produce a

useful (specific, substantial and credible),

concrete (substantially repeatable / non unpredictable), and

tangible (real world / non abstract) result (tangibility is the opposite of

abstractness).

A claim that is so broad that it reads on both statutory and non-statutory subject

matter must be amended, and if the specification discloses a practical application but

the claim is broader than the disclosure such that it does not require the practical

application, then the claim must be amended. Such is **"values of the quantity entered**

in the multidimensional output data array."

However, the portions of the opinions in State Street and AT&T relying <u>solely</u> on

a "useful, concrete and tangible" result analysis *should no longer be relied on*. Ex parte

Bilski, Appeal No. 2007-1130 (Fed. Cir. October 30, 2008.   This decision did NOT state

a tangible result was no longer needed.

The court has said that there's a two-pronged test to determine whether a software of method process patent is valid: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. In other words, pure software or business method patents that are neither tied to a specific machine nor change something into a different state are not patentable.

In Diehr the court drew a distinction between claims that "seek to pre-empt the use of" a fundamental principle, on the one hand, and claims that seek only to foreclose others from using a particular "application" of that fundamental principle. The applicant in this case is *pre-empting substantially all applications of multidimensional output data array*. If the applicant wishes to foreclose others from using a particular 'application' of inferencing, then the examiner recommends that the claims be pointed to those applications.

Accordingly, one may not patent every "substantial practical application" of an idea, law of nature or natural phenomena because such a patent "in practical effect would be a patent on the [idea, law of nature or natural phenomena] itself." "Here the "process" claim is so abstract and sweeping as to cover both known and unknown uses of the BCD to pure-binary conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery or without any apparatus." Gottschalk v. Benson, 409 U.S. 63, 71-72, 175 USPQ 673, 676 (1972).

> [In Abele], we held unpatentable a broad independent claim reciting a process of graphically displaying variances of data from average values. *Abele*, 684 F.2d at 909. **That claim did not specify any particular type or nature of data; nor did it specify how or from where the data was obtained or what the data**

represented. *Id.*; ... In contrast, we held one of Abele's dependent claims to be drawn to patent-eligible subject matter where it specified that "said data is X-ray attenuation data produced in a two dimensional field by a computed tomography scanner." *Abele*, 684 F.2d at 908-09. This data clearly represented physical and tangible objects, namely the structure of bones, organs, and other body tissues. Thus, the transformation of that raw data into a particular visual depiction of a physical object on a display was sufficient to render that more narrowly-claimed process patent-eligible.

... So long as the claimed process is limited to a practical application of a fundamental principle to transform **specific** data, and the claim is limited to a **visual depiction that represents specific physical objects or substances**, there is no danger that the scope of the claim would wholly pre-empt all uses of the principle.

This court and our predecessor court have frequently stated that adding a data-gathering step to an algorithm is insufficient to convert that algorithm into a patent-eligible process. *E.g.*, *Grams*, 888 F.2d at 840 (step of "deriv[ing] data for the algorithm will not render the claim statutory"); *Meyer*, 688 F.2d at 794 ("[data-gathering] step[s] cannot make an otherwise nonstatutory claim statutory"). ... **A requirement simply that data inputs be gathered—without specifying how—is a meaningless limit** on a claim to an algorithm because every algorithm inherently requires the gathering of data inputs. *Grams*, 888 F.2d at 839-40. Further, the inherent step of gathering data can also fairly be characterized as **insignificant extra-solution activity**. *See Flook*, 437 U.S. at 590. (See In re Bilski, 88 USPQ2d 1397-1398, emphasis added)

As a corollary, the *Diehr* Court also held that **mere field-of-use limitations are generally insufficient** to render an otherwise ineligible process claim patent-eligible. *See* 450 U.S. at 191-92 (noting that ineligibility under §101 "cannot be circumvented by attempting to limit the use of the formula to a particular technological environment"). ... Pre-emption of all uses of a fundamental principle in all fields and pre-emption of all uses of the principle in **only one field** both indicate that the claim is **not** limited to **a particular application** of the principle. *See Diehr*, 450 U.S. at 193 n.14 ("A mathematical formula *in the abstract* is nonstatutory subject matter regardless of whether the patent is intended to cover all uses of the formula or only limited uses.") (emphasis added). ...

The *Diehr* Court also reaffirmed a second corollary to the machine-or-transformation test by stating that "insignificant postsolution activity will **not** transform an unpatentable principle into a patentable process." *Id.* at 191-92; *see also Flook*, 437 U.S. at 590 ("The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance."). The Court in *Flook* reasoned:

> A competent draftsman could attach some form of post-
> solution activity to almost any mathematical formula; the
> Pythagorean theorem would **not** have been patentable, or
> partially patentable, because a patent application contained
> a final step indicating that the formula, when solved, could
> be usefully applied to existing surveying techniques.
>
> 437 U.S. at 590. Therefore, **even if** a claim recites a specific machine or a
> particular transformation of a specific article, the recited machine or
> transformation **must not constitute mere "insignificant postsolution activity."**
> (See In re Bilski, 88 USPQ2d 1393, emphasis added)

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6.   Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Stadler

(USPN 2002/0016548, referred to as **Stadler**).

Claim 1, 11, 12:

        Stadler teaches a method of analyzing a quantity having temporal and spatial

variations, wherein a multidimensional output data array is formed (**Stadler**, ¶ 0063:

multi-dimensional "spatial vector") the multidimensional output data array comprises

array positions (**Stadler**, ¶ 0029: 3-dimensional vector, whose position is determined)

arranged along at least a first data-axis and a second data-axis (**Stadler**, ¶ 0065: three

axis EGM signals), values of the quantity are entered in the multidimensional output

data array, such that values of the quantity at substantially the same instant are entered

at respective positions in the multidimensional output data array at equal positions along

the first data-axis (**Stadler**, ¶ 0083: defining a set of sampled time points; **EN:** sampled

time points are values at particular instants of time; **EN:** A sampled time-varying data is

periodic, meaning it repeats at fixed/equal intervals of time, where the periodicity is

defined by the sampling rate) and values of the quantity at substantially the same

spatial position are entered at respective positions in the multidimensional output data

array at equal positions along the second data-axis (**Stadler**, ¶ 0063: spatial vectors).

Regarding, 'entered at respective positions in the multidimensional output data array at

equal positions, see (**Stadler**, ¶ 0083: defining a set of sampled time points; **EN:**

sampled time points are values at particular instants of time). A sampled time-varying

data is periodic, meaning it repeats at fixed/equal intervals of time, where the periodicity

is defined by the sampling rate.

Claim 2:

    Stadler teaches a method as claimed in claim 1, wherein values of the quantity

are acquired for respective temporal instants and for respective spatial sections and

values of the quantity for individual spatial sections are entered at respective positions

in the multidimensional output data array at equal positions along the second data-axis

(**Stadler**, ¶ 0063: processing spatial vectors; **EN:** processing involves entering positions

on the axis).

Claim 3:

Stadler teaches a method as claimed in claim 1, wherein values of the quantity
are acquired for respective time intervals (**Stadler**, ¶ Data related to … generated in real
time) and for respective spatial positions and values of the quantity for individual time
interval are entered at respective positions in the multidimensional output data array at
equal positions along the first data-axis (**Stadler**, ¶ 0073: manipulating the data values).

Claim 4:

Stadler teaches a method as claimed in claim 1, wherein values of the quantity
for successive time intervals are entered at adjacent positions (**Stadler**, ¶ 0005: PQRST
sequence) in the multidimensional output data array and values of the quantity for
adjacent spatial sections are entered at adjacent positions in the multidimensional
output data array (**Stadler**, ¶ 0005: successive PQRST complexes).

Claim 5:

Stadler teaches a method as claimed in claim 4, wherein values of the quantity
for radially contiguous spatial sections (**Stadler**, ¶ 0139: radians per cardiac cycle) are
entered at contiguous positions in the multidimensional output data array (**Stadler**, ¶
0139: filter characteristics are tuned from empirical data).

Claim 6:

Stadler teaches a method as claimed in claim 1, wherein the values of the

quantity are derived from a series of images (**Stadler**, ¶ 0002: monitoring

electrocardiogram).

Claim 7:

Stadler teaches a method as claimed in claim 6, wherein values of the quantity at

respective instants are derived from respective images in said series of images

(**Stadler**, ¶ 0005: waveform characterized by a periodic PQRST electrical activation

sequence).

Claim 8:

Stadler teaches a method as claimed in claim 7, wherein respective positions in

the multidimensional output data array are linked to respective spatial sections in

respective images of the series (**Stadler**, ¶ 0063: processing spatial vectors).

Claim 9:

Stadler teaches a method as claimed in claim 8, wherein the multidimensional

output data array is displayed, a position in the displayed multidimensional output data

array is indicated and on the basis of the indicated position in the displayed

multidimensional output data array the corresponding image of the series is displayed

and the corresponding spatial section in the image is marked (**Stadler**, ¶ 0056: A

display 59 would enable graphic and textual interface).

Claim 10:

Stadler teaches a method as claimed in claim 1, wherein the quantity pertains to perfusion of the myocardium (**Stadler**, ¶ 0007: ischemic myocardium).

Claim 13:

Stadler teaches the method of claim 1, further comprising displaying the multidimensional output data array (**Stadler**, ¶ 0056: A display 59).

Claim 14:

Stadler teaches the method of claim 13, wherein the values of the quantity are derived from image data, and further comprising displaying the image data while displaying the multidimensional output data array (**Stadler**, ¶ 0070: data related to detection of ischemia).

Claim 15:

Stadler teaches the method of claim I, wherein the quantity is an average brightness value of image data (**Stadler**, ¶ 0010: an average normal ST signal level).

Claim 16:

Stadler teaches the method of claim 15, wherein the image data comprises perfusion data of a human myocardium (**Stadler**, ¶ 0007: ischemic myocardium).

Claim 17:

Stadler teaches the system of claim 11, further comprising a display device adapted to display the multidimensional output data array (**Stadler**, ¶ 0056: display 59).

Claim 18:

Stadler teaches the system of claim 17, wherein the values of the quantity are derived from image data, and wherein the display device is further adapted to display the image data while displaying the multidimensional output data array (**Stadler**, Fig 4 & 5).

Claim 19:

Stadler teaches the system of claim 11, wherein the quantity is an average brightness value of image data (**Stadler**, ¶ 0010: an average normal ST signal level).

Claim 20:

Stadler teaches the system of claim 19, wherein the image data comprises perfusion data of a human myocardium (**Stadler**, ¶ 0007: ischemic myocardium).

Response to Argument

7.   Applicant's arguments filed 12/01/2008 have been fully considered but they are

not persuasive.

8.   Regarding Applicant's arguments on page 5-6/Claims 1-5:

The "spatial vector" taught in Stadler is derived from mathematically combining

electrocardiogram signals from selected pairs of the three lead vectors … It is not a

multidimensional output data array that is populated with values as required by claim 1.

Stadler fails to teach aligning any values in a multidimensional data array as

required by claim 1.

Examiner's response:

The Examiner disagrees. One of ordinary skill would agree that a data is

'multidimensional' if it has more than one dimension in space, or more than one

coordinate(s) or axis onto which the data is mapped. The spatial vector in Stadler has

data values on at least two axis (**Stadler, ¶ 0063-0065**: three axis EGM signals).

Therefore it is a multidimensional data. The source of the type of data (EGM) is not

significant because the applicant has not specified any particular data type. Further,

see (**Stadler, ¶ 0063**: multi-dimensional "spatial vector") for multidimensional data array,

which is no different from the applicant's multidimensional output data.

Regarding, 'entered at respective positions in the multidimensional output data

array at equal positions, see (**Stadler, ¶ 0083**: defining a set of sampled time points;

EN: sampled time points are values at particular instants of time). A sampled time-

varying data is periodic, meaning it repeats at fixed/equal intervals of time, where the

periodicity is defined by the sampling rate.

Regarding 'aligning any values in a multidimensional data array', the applicant

has not claimed 'alignment'. There is no mention of the claimed limitation in the claims

and the specification is not the measure of the invention. Therefore, limitations

contained therein cannot be read into the claims for the purpose of avoiding the prior

art; see In re Sprock, 55 CCPA 743, 386 F.2d 924, 155 USPQ 687 (1968). However,

the Examiner would like to add the rationale that – when data is sampled in time,

(**Stadler**, ¶ 0083: defining a set of sampled time points), 'alignment of data' is

automatically defined or is inherent.

9.   Regarding Applicant's arguments on page 16/claim 6:

Stadler fails to teach that any values … are derived from a series of images.

Examiner's response:

See (**Stadler**, ¶ 0002: monitoring electrocardiogram). The electrocardiogram is nothing

but 'medical imaging'. Therefore, the data derived from ecg is data derived from a

series of medical images.

10.   Regarding Applicant's arguments on page 6/claims 7:

Stadler fails to teach that values of quantity at respective instants are derived from

respective images.

Examiner's response:

See (**Stadler**, ¶ 0005: waveform characterized by a periodic PQRST electrical activation

sequence) and (**Stadler**, ¶ 0002: monitoring electrocardiogram). It is well known in the

medical arts that ECG images are captured at respective instants of time. Hence, the

data derived from the ECG would be values at respective instants of time.

11.   Regarding Applicant's arguments on page 7/claim 8:

Stadler fails to teach that respective positions in the multidimensional output data array

are linked to respective spatial sections in respective images.

Examiner's response:

The argument is moot in view of the new grounds of rejection. A spatial vector

processing will clearly establish links to respective spatial sections.

12.   Regarding Applicant's arguments on page 7/claim 9:

Stadler fails to teach that the multidimensional output array is displayed ….

Examiner's response:

See (**Stadler**, ¶ 0056: A display 59 would enable graphic and textual interface).

13.   Regarding Applicant's arguments on page 7/claim 10:

Stadler fails to teach values of any quantity pertains to perfusion of the myocardium.

        Examiner's response:

See (**Stadler**, ¶ 0007: ischemic myocardium).

14.   Regarding Applicant's arguments on page 8/claim 11-15:

Claims 11-14 have no new arguments other than the ones previously discussed.

Regarding claim 15, Stadler fails to teach that the quantity is an average brightness

value of image data.

    Examiner's response:

See **Stadler**, ¶ 0010: an average normal ST signal level).

    EN: Claims 16 to 20 don't pose any specific argument that needs to be

addressed.

Examination Considerations

15.   Examiner has cited particular columns and line numbers or paragraph numbers

in the references applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are

applied to specific limitations within the individual claim, other passages and figures

may apply as well. It is respectfully requested from the Applicant in preparing

responses, to fully consider the references in their entirety as potentially teaching all or

part of the claimed invention, as well as the context of the passage as taught by the

prior art or disclosed by the Examiner. The entire reference is considered to provide

disclosure relating to the claimed invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALPANA BHARADWAJ whose telephone number is (571)270-1641. The examiner can normally be reached on Monday-Friday 7:30am 5:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on (571) 272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bharadwaj Kalpana/
Examiner, Art Unit 2129
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